Sandia National Laboratories/New Mexico

PROPOSAL FOR CONFIRMATORY SAMPLING NO FURTHER ACTION ENVIRONMENTAL RESTORATION SITE 12A OPEN ARROYO, LURANCE CANYON BURN SITE OPERABLE UNIT 1333

May 1997

Environmental
Restoration
Project

United States Department of Energy
Albuquerque Operations Office

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Prepared by
Sandia National Laboratories/New Mexico
Environmental Restoration Project
Albuquerque, New Mexico

Prepared for
the U.S. Department of Energy

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ACRONYMS AND ABBREVIATIONS

CEARP	Comprehensive Environmental Assessment and Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
Cs-137	cesium-137
DOE	Department of Energy
DOU	Document of Understanding
DU	depleted uranium
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ft	foot/feet
GM	Geiger Müller
HSWA	Hazardous and Solid Waste Amendment Act
mg/kg	milligrams per kilogram
NaI	sodium iodide
NFA	No Further Action
NMED	New Mexico Environment Department
OB	Oversight Bureau
ppm	parts per million
PRS	potential release site
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
SNL/NM	Sandia National Laboratories/New Mexico
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TPH	total petroleum hydrocarbons
UTL	upper tolerance limit
UXO/HE	unexploded ordnance/high explosives
VCM	Voluntary Corrective Measure
XRF	x-ray fluorescence

1.0 INTRODUCTION

1.1 Description of ER Site 12A

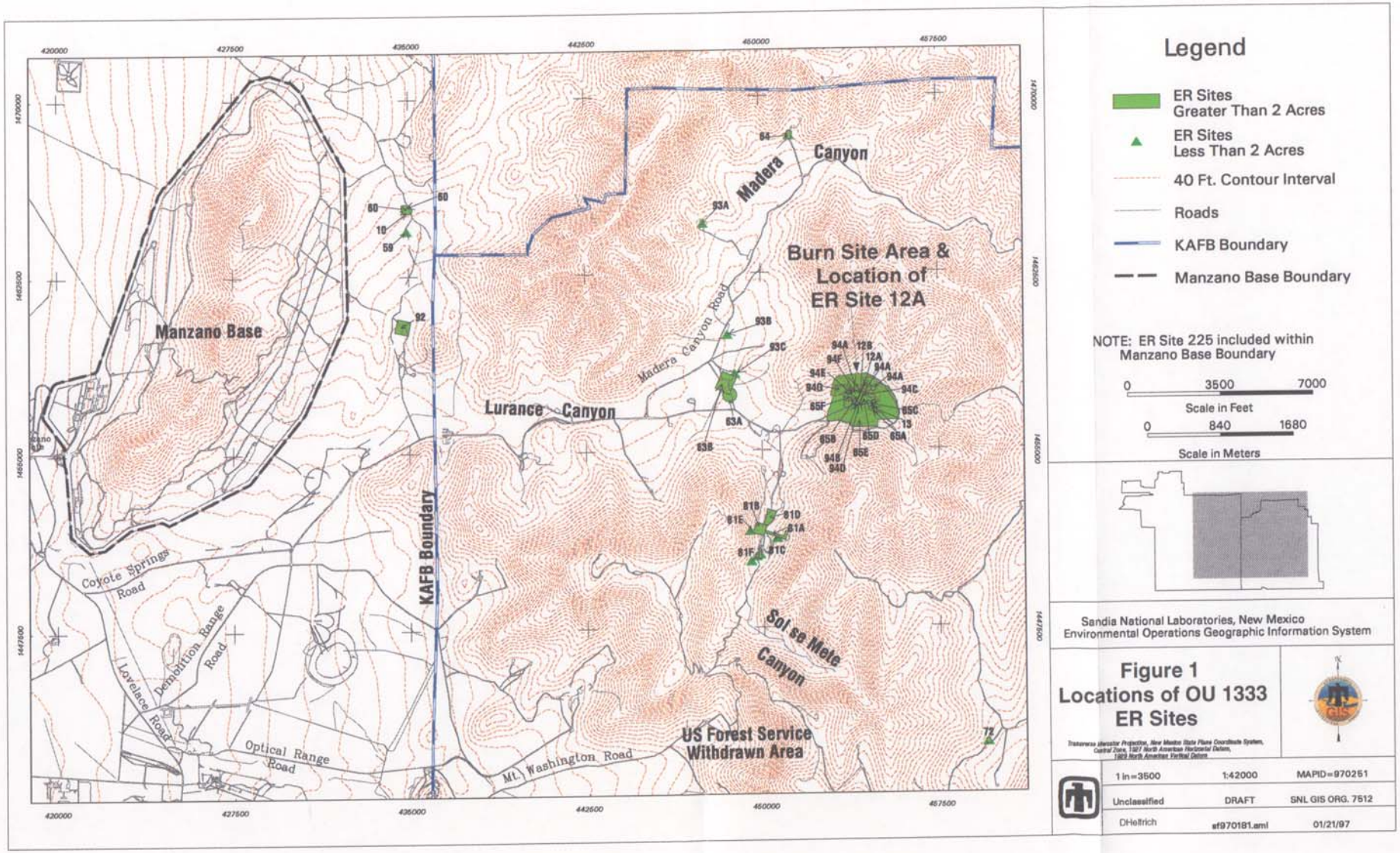
Environmental Restoration (ER) Site 12 is identified as Burial Site/Open Dump (Lurance Canyon) in the Sandia National Laboratories/New Mexico (SNL/NM) Hazardous and Solid Waste Amendments Act (HSWA) Module. This site comprises approximately 0.6 acre (SNL/NM April 1995) of United States Air Force land withdrawn from the Bureau of Land Management and permitted to the Department of Energy (DOE). ER Site 12 is located within ER Site 94 (Lurance Canyon Burn Site), which is an active site, and ER Site 65 (Lurance Canyon Explosive Test Site), which is inactive. The Burn Site and Site 12 are located within the closed upper reaches of the Lurance Canyon drainage (Figure 1). The Lurance Canyon drainage is surrounded by moderately steep sloping canyon walls, and the immediate topographic relief around the site is over 500 feet (ft) (Figure 2). The canyon floor at the site is isolated by the canyon walls except for the western drainage into Arroyo del Coyote. Coyote Springs Road follows this drainage and is the main access into Lurance Canyon (Figure 1). The mean elevation of the site is 6,350 feet above sea level (SNL/NM April 1995).

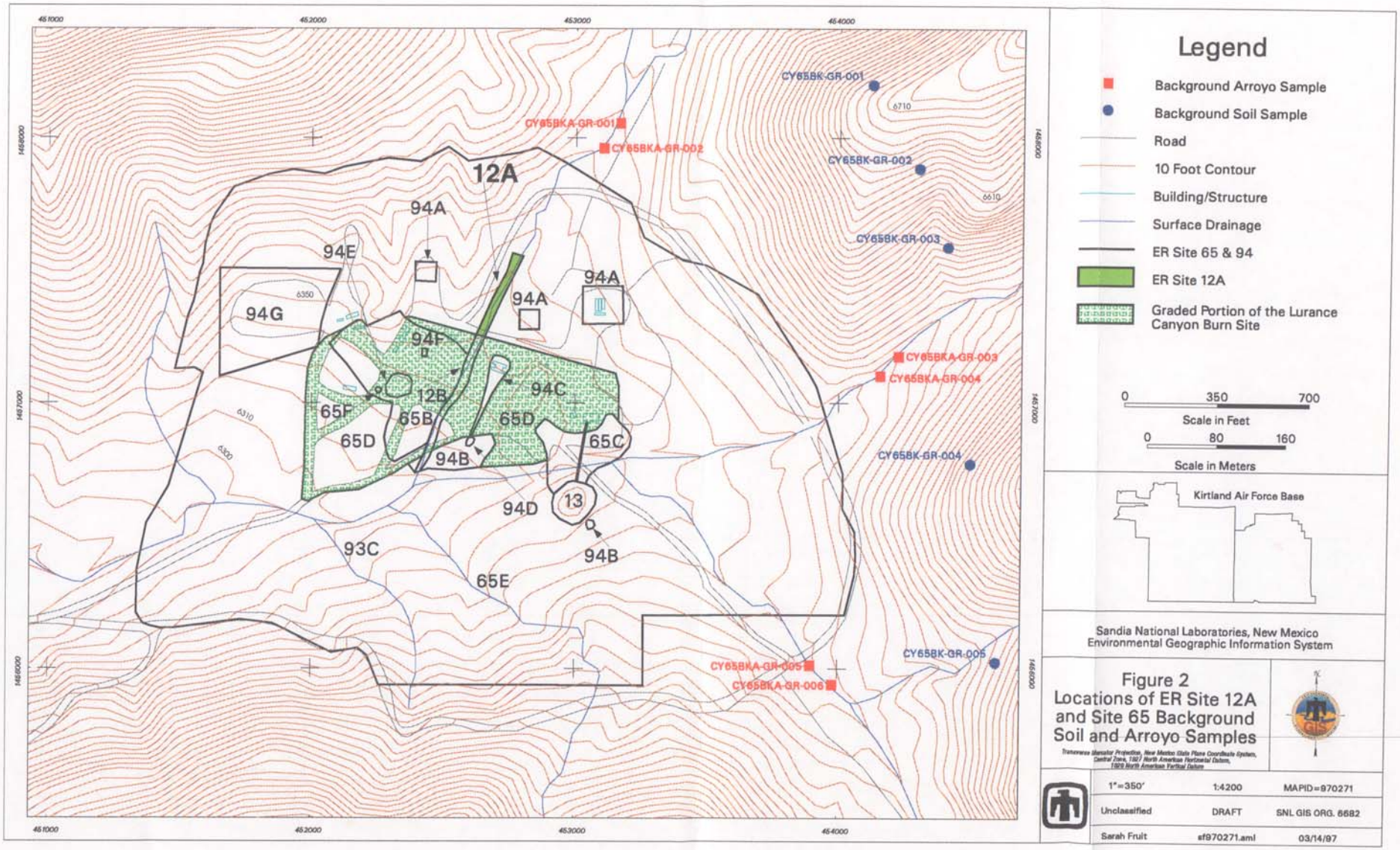
ER Site 12 (Burial Site/Open Dump), located within a northeast-southwest-trending arroyo channel, is subdivided into two inactive subunits: Site 12A (Open Arroyo) and Site 12B (Buried Debris in Graded Area). Site 12A occupies the natural arroyo channel immediately north of the graded portion of the Burn Site (Figure 2). Site 12B is located within the graded area and represents the part of the arroyo channel that was buried. Site 12B is being addressed with a Voluntary Corrective Measure (VCM). This proposal for a decision of No Further Action (NFA) concerns only the 12A portion of the site.

ER Site 12A is approximately 300 ft long and 20 to 35 ft wide. This site extends from the approximate location of some concrete blocks and debris on the north to the junction with the buried arroyo channel on the northern boundary of the graded portion of the Burn Site (Figure 2).

1.2 No Further Action Basis

This proposal for a determination of a confirmatory sampling-based NFA decision has been prepared using the criteria presented in Annex B of the Environmental Restoration Document of Understanding (DOU) (NMED April 1996). Specifically, this proposal will "contain information demonstrating that there are no releases of hazardous waste (including hazardous constituents) from solid waste management units (SWMUs) at the facility that may pose a threat to human health or the environment" (as proposed in the Code of Federal Regulations [CFR] Title 40 Part 264.51[a][2] [EPA, July 1990]). The HSWA Module IV contains the same requirements for an NFA demonstration:


Manzano Base
KAFB Boundary
Burn Site Area & Location of ER Site 12A
Madera Canyon
Madera Canyon Road
Lurance Canyon
Sol se Mete Canyon
US Forest Service Withdrawn Area
Coyote Springs Road
Demolition Range Road
Lovelace Road
Optical Range Road
Mt. Washington Road
420000
427500
435000
442500
450000
457500
1470000
1462500
1455000
1447500
Legend
ER Sites Greater Than 2 Acres
ER Sites Less Than 2 Acres
40 Ft. Contour Interval
Roads
KAFB Boundary
Manzano Base Boundary
NOTE: ER Site 225 included within Manzano Base Boundary
0 3500 7000
Scale in Feet
0 840 1680
Scale in Meters
Sandia National Laboratories, New Mexico
Environmental Operations Geographic Information System
Figure 1
Locations of OU 1333
ER Sites
1 in=3500
1:42000
MAPID=970251
Unclassified
DRAFT
SNL GIS ORG. 7512
DHeltrich
sf970181.aml
01/21/97


451000
452000
453000
454000
1458000
1457000
1456000
12A
94A
94E
94G
94F
94C
12B
65F
65B
65D
65C
94B
94D
13
93C
65E
6350
6310
6300
6710
6610
CY65BK-GR-001
CY65BKA-GR-001
CY65BKA-GR-002
CY65BK-GR-002
CY65BK-GR-003
CY65BKA-GR-003
CY65BKA-GR-004
CY65BK-GR-004
CY65BK-GR-005
CY65BKA-GR-005
CY65BKA-GR-006
Legend
Background Arroyo Sample
Background Soil Sample
Road
10 Foot Contour
Building/Structure
Surface Drainage
ER Site 65 & 94
ER Site 12A
Graded Portion of the Lurance Canyon Burn Site
0
350
700
Scale in Feet
0
80
160
Scale in Meters
Kirtland Air Force Base
Sandia National Laboratories, New Mexico
Environmental Geographic Information System
Figure 2
Locations of ER Site 12A and Site 65 Background Soil and Arroyo Samples
Transverse Mercator Projection, New Mexico State Plane Coordinate System, Central Zone, 1927 North American Horizontal Datum, 1929 North American Vertical Datum
1"=350'
1:4200
MAPID=970271
Unclassified
DRAFT
SNL GIS ORG. 6682
Sarah Fruit
sf970271.aml
03/14/97

> Based on the results of the RFI (RCRA Facility Investigation) and other relevant information, the permittee may submit an application to the Administrative Authority for a Class III permit modification under 40 CFR 270.42(c) to terminate the RFI/corrective measures study process for a specific unit. This permit modification application must contain information demonstrating that there are no releases of hazardous waste including hazardous constituents from a particular SWMU at the facility that pose threats to human health and/or the environment, as well as additional information required in 40 CFR 270.42(c) (EPA August 1993).

If the available archival evidence is insufficient, SNL/NM performs confirmatory sampling to support an informed decision on whether to proceed with the confirmatory sampling-based NFA or to return to the site characterization program for additional data collection (SNL/NM February 1995).

The U. S. Environmental Protection Agency (EPA) has acknowledged that the extent of required confirmatory sampling may vary greatly, stating that:

> the agency does not intend this rule [the second codification of HSWA] to require extensive sampling and monitoring at every SWMU. . . . Sampling is generally required only in situations where there is insufficient evidence on which to make an initial release determination. . . . The actual extent of sampling will vary . . . depending on the amount and quality of existing information available (EPA December 1987).

This request for an NFA decision for ER Site 12A is based primarily on archival and survey information and on confirmatory soil analytical results collected in May 1996 (after a surface radiation VCM) to satisfy the permit requirements. A surface radiation survey and VCM conducted at the site has successfully removed the surface radiation anomalies identified at the site. Soil sampling has indicated that no residual radiological contamination exists, and that no chemical contamination is present at the site. A site is eligible for an NFA proposal if it meets one or more of the following criteria outlined in the DOU (NMED April 1996):

- NFA Criterion 1: The site cannot be located or has been found not to exist, is a duplicate potential release site (PRS), or is located within and, therefore, investigated as part of another PRS.

- NFA Criterion 2: The site has never been used for the management (i.e., generation, treatment, storage, or disposal) of Resource Conservation and Recovery Act (RCRA) solid or hazardous wastes and/or constituents or other Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances.

- NFA Criterion 3: No release to the environment has occurred, nor is likely to occur in the future.

- NFA Criterion 4: There was a release, but the site was characterized and/or remediated under another authority which adequately addressed corrective action; documentation, such as a closure letter, is available.

- NFA Criterion 5: The PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Specifically, ER Site 12A is being proposed for confirmatory sampling NFA decision because it is apparent that no release to the environment has occurred, nor is likely to occur in the future (NFA Criterion 3).

2.0 HISTORY OF ER SITE 12A

2.1 Historical Operations

Based on a review of available historical aerial photographs, ER Site 12 was undeveloped prior to 1971 (SNL/NM August 1994). A 1975 aerial photograph indicates that site grading activities had buried a small portion of the lower arroyo. In a 1983 aerial photograph, the central and southern portions of the graded area at ER Site 65 cover the lower part of the arroyo (now identified as ER Site 12B) (SNL/NM August 1994). Based on this historical aerial photograph record, activity at ER Site 12 was associated with the historical operation of ER Site 65 and/or the construction activities associated with ER Site 94. Because ER Site 12 is located adjacent to ER Site 65B, which was used for explosives testing involving depleted uranium (DU), the site is currently listed as a radiological soil contamination area.

Prior to 1990, approximately eight to ten drums, wooden pallets, twisted metal, and concrete blocks reportedly were disposed of, or placed, in the open arroyo channel of ER Site 12A (SNL/NM September 1995). In the summer of 1990, several of the drums were washed down the arroyo during a heavy rainstorm. One of the drums was opened and determined to contain Tyvek coveralls. All of the drums were removed from the site. The contents of the other drums were not documented, and the origin of the drums is unknown.

2.2 Previous Audits, Inspections, and Findings

The following sections provide information regarding previous investigations conducted at ER Site 12A.

2.2.1 CEARP and RFA

ER Site 12 was identified during investigations conducted under the Comprehensive Environmental Assessment and Response Program (CEARP) (DOE September 1987) and the RCRA Facility Assessment (RFA) (EPA April 1987). Most of the information gathered related to Site 12 in general, and appears more directly applicable to Site 12B than Site 12A. Site development left the northern portion of the arroyo open (ER Site 12A) while the southern portion (ER Site 12B) was graded over.

Information obtained from site personnel during the RFA interviews indicated that metal objects, wood, and full drums were disposed of at Site 12. DU, lead, and beryllium also might have been disposed of at the site (EPA April 1987). As indicated above, accounts of disposals of debris and potential contamination are more relevant to Site 12B, in which items were buried, rather than to Site 12A, which has remained open and relatively free of debris.

In more recent interviews, site personnel indicated that the reported drums were washed down from an unknown upstream location into the graded area. As indicated earlier, however, all

drums and material that had washed down were removed from the Site 12A area and disposed of by SNL/NM waste management personnel. During the facility cleanup, site personnel walked upstream well beyond the Site 12A northern boundary to ensure that no additional drums or potential waste was present. Several recent walkover surveys of Site 12A revealed no visual evidence of anything other than minor amounts of concrete and wood debris.

2.2.2 Unexploded Ordnance/High Explosives Survey

In October 1993, Kirtland Air Force Base/Explosive Ordnance Disposal personnel conducted a visual survey for the presence of unexploded ordnance and high explosives (UXO/HE) on the ground surface at ER Site 12. The survey identified one live trip flare. A second visual survey of Site 12A was conducted just prior to confirmatory soil sampling in May 1996. No ordnance or ordnance debris was found during this survey.

2.2.3 Radiological Surveys

During November and December 1993 and January 1994, RUST Geotech Inc. conducted a surface gamma radiation survey of ER Sites 12, 13, 65, and 94. A total of six radiation anomalies were identified in the immediate vicinity of ER Site 12A; all were point sources (five soil and one fragment point sources) and ranged from approximately 16 to 83 microroentgens per hour (RUST Geotech Inc. December 1994). The occurrence of radiation point-source anomalies at Site 12A is probably related to Site 65 explosive testing, which involved DU components.

As part of the SNL/NM site-wide Surface Radiation Removal VCM, all radiation anomalies in the vicinity of Site 12A were cleaned up in May 1995. A verification sample collected subsequent to cleanup of one of the anomalies was analyzed for radiological constituents by gamma spectroscopy and indicated no residual radiological contamination (Table 2-1).

Table 2-1
Summary of Gamma Spectroscopy Results for Radiation Anomaly
Cleanup Verification Soil Sample at Site 12A, May 1995.
Radiological activities (all in pCi/g)

Sample Name	Sample Depth (ft)	Cs-137	Ra-226	Ra-228	Th-232	Th-234	U-235	U-238
94E25-SS	0-0.5	0.591	0.824	0.422	0.331	ND	ND	ND

Notes: pCi/g - Picocuries per gram; ft - feet; ND - Not detected.
Radiological constituents: Cs - cesium; Ra - radium; Th - thorium; U - uranium.

In concert with the follow-on confirmatory soil sampling conducted in May 1996, a radiological survey of each of the four confirmatory sampling locations was performed with both a Geiger-Müller (GM) pancake probe and a sodium-iodide (NaI) detector. No radiation readings above natural background were detected.

2.2.4 Cultural-Resources Survey

A cultural-resources survey was conducted as part of the assessment of the Lurance Canyon Burn Site. No cultural resources were identified at or in the near vicinity of ER Site 12A (SNL/NM September 1995).

2.2.5 Sensitive-Species Survey

A sensitive-species survey was conducted as part of a biological assessment of the Lurance Canyon Burn Site (SNL/NM September 1995). No sensitive species were found in the vicinity of Site 12A during this survey.

2.2.6 Soil Sampling

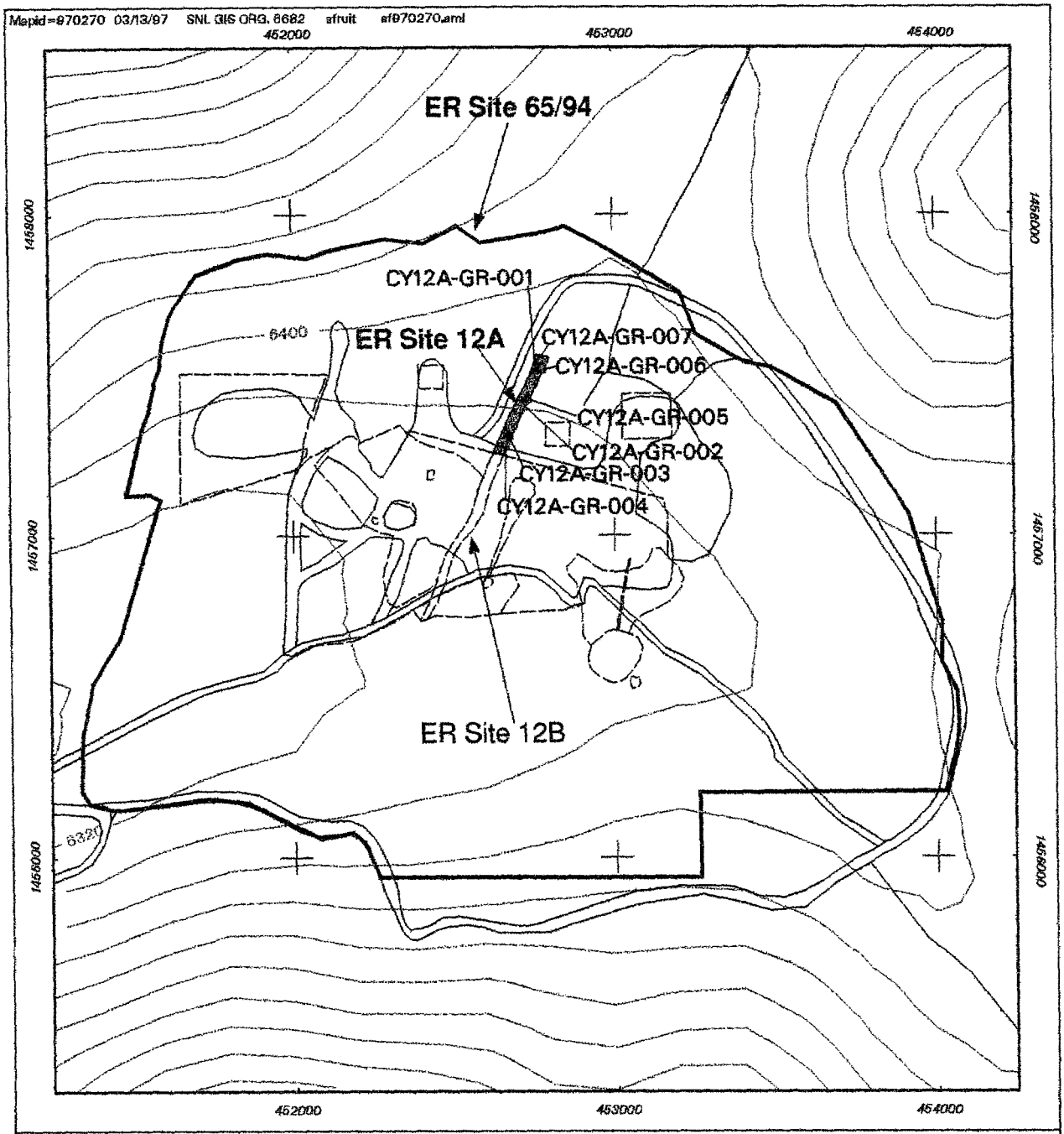
Following are discussions of initial scoping sampling, background sampling, and confirmatory soil sampling at ER Site 12A. Results of this sampling are discussed in Section 3.2.

2.2.6.1 Scoping Sampling

Initial scoping soil sampling was conducted at Site 12A in July 1995 to determine the presence of any contamination at the site. Three locations (CY12A-GR-001 through -003, Figure 3) were sampled at depths of 0 to 6 inches and 6 to 12 inches. The samples were analyzed semiquantitatively for total petroleum hydrocarbons (TPH) using immunoassay techniques, for metals using X-ray fluorescence (XRF), and for radionuclides by gamma spectroscopy.

2.2.6.2 Background Sampling in the Vicinity of the Burn Site (ER Sites 65/94)

An investigation of the background soils immediately surrounding the Burn Site (i.e., ER Sites 65 and 94) was conducted in May 1996. In consultation with the New Mexico Environment Department (NMED) and DOE Oversight Bureau (OB) personnel, background sampling locations were chosen in the vicinity of the Burn Site (Figure 2), well outside the Site 65 boundary roughly defined by the firebreak road. A total of 11 sample locations were chosen: 6 within the arroyos that flow into the Burn Site area, hereinafter referred to as the "background arroyo" locations, and 5 samples located on hillslopes, defined as the "background soil" locations. Each location was sampled at two depth intervals: 0 to 6 inches, and 6 to 12 inches, and two duplicates were collected, for a total of 24 samples. Each sample was analyzed at an off-site laboratory for RCRA metals (i.e., arsenic, barium, cadmium, chromium, lead, mercury,



Legend

- Scoping Sample Location
- Confirmatory Sample Location
- Road
- 40 Foot Contour
- Other ER Site
- ER Site 12A
- ER Sites 65/94

Figure 3
ER Site 12A
Scoping and Confirmatory Soil Sample Locations

0 250 500
Scale in Feet

0 60 120
Scale in Meters

N

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

silver, and selenium) plus beryllium, in accordance with EPA Methods 6010/7000, and for radionuclides by gamma spectroscopy.

2.2.6.3 Confirmatory Sampling of ER Site 12A

Because the semiquantitative results for the scoping samples collected in July 1995 indicated no contamination (discussed in Section 3.2.1), ER Site 12A was sampled for quantitative analysis in May 1996, after consultation with NMED and DOE-OB personnel. Four locations (CY12A-GR-004 through -007) were chosen based on the following changes requested by NMED and DOE-OB personnel:

- One sample location (CY12A-GR-004) was moved to a point farther south in the arroyo.
- Scoping sample location CY12A-GR-002 was resampled as CY12A-GR-005.
- Sample location CY12A-GR-006 was moved to point bar deposits in the center of the channel.
- A fourth location (CY12A-GR-007) was added to sample the soil near an area of minor concrete debris on the side of the western bank of the arroyo.
- Each location was sampled at two depths: 0 to 6 inches and 6 to 12 inches.

All samples were analyzed at an off-site analytical laboratory for RCRA metals and beryllium by EPA Methods 6010/7000, for HE by EPA Method 8330, and for semivolatile organic compounds (SVOC) by EPA Method 8270. In addition, one sample (CY12A-GR-004) was analyzed for radiological constituents by gamma spectroscopy.

3.0 EVALUATION OF RELEVANT EVIDENCE

Following are discussions of the evidence presented in support of a decision of NFA for ER Site 12A.

3.1 Unit Characteristics and Operating Practices

Based on historical information of the operating practices at ER Site 12A, no burials occurred at the site that would have caused subsurface contamination. Site 12A was not a subsurface disposal area. Because the arroyo at Site 12 was divided into the open arroyo (Site 12A) and the buried arroyo (Site 12B), any material deposited at ER Site 12A was surficial in nature. There is currently no visual evidence of contamination (e.g., staining) at the site.

3.2 Results of Sampling/Surveys

Following are discussions of the soil sampling conducted at Site 12A and at the background locations.

3.2.1 Scoping Sampling Results

The semiquantitative (screening) results for the scoping sampling did not indicate any contamination present at Site 12A. TPH was detected in one sample only (CY12A-GR-002, from 0 to 6 inches). Arsenic, beryllium, cadmium, chromium, mercury, selenium, and silver were undetected at their respective XRF method detection limits. Barium ranged from 84 to 120 parts per million (ppm); lead ranged from non-detect to 13 ppm (Table 3-1). No radioactive contamination was indicated by the radiological analytical results.

3.2.2 Burn Site Background Soil Sampling Results

Following receipt of the background soil analytical results, a statistical comparison was conducted to produce a set of background concentration upper tolerance limits (UTL) for the Burn Site area (including Sites 65 and 94). Both depth intervals were combined for each set (i.e., the arroyo and the soil locations) after it was determined that the results were statistically similar across the interval from 0 to 12 inches. Only two exceptions to this were noted: the soil UTLs for lead and cesium-137 (Cs-137) are broken out by depth. A more detailed discussion of the statistical tests applied to arrive at the UTLs listed in Table 3-2 is provided in a SNL/NM ER Project file memo (SNL/NM February 1997). For completeness, both the arroyo and soil UTLs are included in Table 3-2. Because ER Site 12A is an open arroyo, the UTLs that are used for comparison are the arroyo samples.

Table 3-1
Summary of Site 12A Scoping Soil Sampling Analytical Results,
July 1995.

Sample Attributes		Metals (mg/kg)									Organic (mg/kg)
Sample Name	Sample Depth (ft)	As	Ba	Be	Cd	Cr	Pb	Hg	Se	Ag	TPH
CY12A-GR-001-0-SS	0-0.5	ND	120	ND	ND	ND	13	ND	ND	ND	ND
CY12A-GR-001-0.5-S	0.5-1.0	ND	90	ND	ND	ND	ND	ND	ND	ND	ND
CY12A-GR-002-0-SS	0-0.5	ND	110	ND	ND	ND	12	ND	ND	ND	Detected
CY12A-GR-002-0.5-S	0.5-1.0	ND	84	ND	ND	ND	ND	ND	ND	ND	ND
CY12A-GR-003-0-SS	0-0.5	ND	110	ND	ND	ND	16	ND	ND	ND	ND
CY12A-GR-003-0.5-S	0.5-1.0	ND	100	ND	ND	ND	ND	ND	ND	ND	ND
Detection Limit (mg/kg)		50	10	3.4	10	10	10	0.2	50	10	10-100
Arroyo Background UTL (mg/kg)		4.95	271.5	0.6	0.74	18.1	14.9	NA	3.6	NA	NA

		Radiological Activities (pCi/g)							
Sample ID	Sample Depth (ft)	Cs-137	Ra-226	Ra-228	Th-232	Th-234	U-234	U-235	U-238
CY12A-GR-001-0-SS	0-0.5	0.069	1.3	0.2	0.216	ND	ND	ND	ND
CY12A-GR-001-0.5-S	0.5-1.0	0.036	1.79	0.216	0.238	0.38	ND	ND	ND
CY12A-GR-002-0-SS	0-0.5	0.155	1.18	0.404	0.327	0.89	ND	ND	0.87
CY12A-GR-002-0.5-S	0.5-1.0	0.043	1.26	0.195	0.169	ND	ND	ND	ND
CY12A-GR-003-0-SS	0-0.5	0.112	1.28	0.433	0.311	ND	ND	ND	ND
CY12A-GR-003-0.5-S	0.5-1.0	0.028	1.25	0.154	0.207	ND	ND	ND	ND
Arroyo Background UTL (pCi/g)		0.88	2.1	0.59	NA	NA	1.1	0.25	1

Notes: mg/kg - Milligrams per kilogram; pCi/g - Picocuries per gram.
Metals: *Analyzed by X-ray fluorescence.* As - arsenic; Ba - barium; Be - beryllium; Cd - cadmium; Cr - chromium; Pb - lead; Hg - mercury; Se - selenium; Ag - silver.
TPH - Total petroleum hydrocarbon - *Analyzed by immunoassay* - presence noted by a yes/no indication.
Radiological constituents: *Analyzed by gamma spectroscopy.* Cs - cesium; Ra - radium; Th - thorium; U - uranium.
ND - Not detected at the method detection limit; UTL - upper tolerance limit; NA - Not applicable.

Table 3-2
Summary of Burn Site Background Concentrations
for Metals and Radionuclides

Metal Constituents

Analyte	As	Ba	Be	Cd	Cr	Pb	Hg	Se	Ag
Arroyo UTL (mg/kg)	4.95	271.5	0.6	0.74	18.1	14.9	NA	3.6	NA
Soil UTL (mg/kg)	7.4	270	0.77	NA	23.2	20.8 (0-6") 15.6 (6-12")	NA	3.5	NA

Radiological Constituents

Analyte	Cs-137	Ra-226	Ra-228	Th-230	U-234	U-235	U-238
Arroyo UTL (pCi/g)	0.88	2.1	0.59	1.2	1.1	0.25	1
Soil UTL (pCi/g)	0.3 (0-6") 0.04 (6-12")	2.2	0.8	1.1	0.9	0.08	0.9

Notes: mg/kg - Milligrams per kilogram; pCi/g - Picocuries per gram.
Metals: As - arsenic; Ba - barium; Be - beryllium; Cd - cadmium; Cr - chromium; Pb - lead; Hg - mercury; Se - selenium; Ag - silver.
Radiological constituents: Cs - cesium; Ra - radium; Th - thorium; U - uranium.
UTL - upper tolerance limit; NA - Not applicable (analyte not detected; therefore, no UTL was calculated).

3.2.3 Confirmatory Soil Sampling Results

A summary of the analytical results for the confirmatory soil samples collected from Site 12A during May 1996 is provided in Table 3-3. None of the samples contained concentrations of HEs, SVOCs, mercury, or silver above their respective detection limits. None of the samples contained any other metals in concentrations above their respective background UTLs, with the exception of one sample that contained an estimated ("J") value of 0.75 milligrams per kilogram (mg/kg) cadmium (just above the UTL of 0.74 mg/kg, but below the detection limit of 1.0 mg/kg).

3.2.4 Summary of Prior Investigations

The surface radiation survey and cleanup VCM at ER Site 12A appears to have successfully remediated the radiation anomalies detected. No ordnance or ordnance debris was detected during the last UXO survey in May 1996. No cultural or biological resources were identified in the vicinity of ER Site 12A.

3.2.5 Summary of Quality Assurance/Quality Control Results

Field and laboratory quality assurance/quality control (QA/QC) samples were collected and analyzed to evaluate data quality. A 100% Level I and II data verification was performed for the analytical results, in accordance with Technical Operating Procedure 94-03 (Verification and

Table 3-3
Summary of Site 12A Confirmatory Soil Sample Analytical Results, May 1996.

Sample Attributes			Metals (EPA 6010/7000) (mg/kg)									Other (mg/kg)	
Sample Number	Sample Name	Sample Depth (ft)	As	Ba	Be	Cd	Cr	Pb	Hg	Se	Ag	HEs (EPA 8330)	SVOCs (EPA 8270)
029632	CY12A-GR-004-0-SS	0-0.5	2.7	167	0.52 J	0.45 J	13.6	11.2 B	ND	ND	ND	ND	ND
029634	CY12A-GR-004-0-SD (duplicate sample)	0-0.5	3.3	183	0.52 J	0.56 J	14	11.2 B	ND	ND	ND	ND	ND
029633	CY12A-GR-004-0.5-S	0.5-1.0	3.1	159	0.44 J	0.38 J	12.9	10.3 B	ND	ND	ND	0.11 J*	ND
029635	CY12A-GR-005-0-SS	0-0.5	3.2	95.4	0.31 J	0.65 J	9.7	8.5 B	ND	ND	ND	ND	ND
029636	CY12A-GR-005-0.5-S	0.5-1.0	2.5	109	0.24 J	0.75 J	10.2	7.1 B	ND	ND	ND	ND	ND
029637	CY12A-GR-006-0-SS	0-0.5	2.1	128	0.32 J	0.63 J	10.5	7.4 B	ND	ND	ND	ND	ND
029638	CY12A-GR-006-0.5-S	0.5-1.0	2.3	118	0.25 J	0.45 J	9.5	5.8 B	ND	ND	ND	ND	ND
029639	CY12A-GR-007-0-SS	0-0.5	2.9	130	0.51 J	0.27 J	11.8	9.2 B	ND	ND	ND	ND	ND
029640	CY12A-GR-007-0.5-S	0.5-1.0	3.2	130	0.37 J	0.4 J	12	7.3 B	ND	0.61 J	ND	ND	ND
029641**	CY12A-GR-001-EB (aqueous equip blank)	NA	ND (3)	ND (5)	ND (1)	ND (1)	ND (2)	ND (2)	ND (0.2)	ND (3)	ND (1)	ND	NA (failed)
Detection Limit (mg/kg)			2	40	1	1	2	2	0.1	1	2	0.25-2.3	0.6-3.4
Arroyo Background UTL (mg/kg)			4.95	271.5	0.6	0.74	18.1	14.9	NA	3.6	NA	NA	NA

			Radiological Activities (pCi/g)						
Sample Number	Sample ID	Sample Depth (ft)	Cs-137	Ra-226	Ra-228	Th-230	U-234	U-235	U-238
029632-001	CY12A-GR-004-0-SS	0-0.5	0.334	1.16	0.647	ND	ND	ND	ND
029633-001	CY12A-GR-004-0.5-S	0.5-1.0	0.182	1.66	0.512	ND	ND	ND	ND
Arroyo Background UTL (pCi/g)			0.88	2.1	0.59	1.2	1.1	0.25	1

Notes: mg/kg - Milligrams per kilogram; pCi/g - Picocuries per gram.
HEs - High explosives; SVOCs - Semi-volatile organic compounds.
Metals: As - arsenic; Ba - barium; Be - beryllium; Cd - cadmium; Cr - chromium; Pb - lead; Hg - mercury; Se - selenium; Ag - silver.
Radiological constituents: Cs - cesium; Ra - radium; Th - thorium; U - uranium.
J - Concentration below the method detection limit (MDL); B - Analyte was detected in the laboratory method blank.
ND - Not detected at the MDL; UTL - upper tolerance limit; NA - Not applicable.
* A single sample contained a "J" value concentration of 0.11 mg/kg 2-nitrotoluene (MDL of 0.28 mg/kg).
** The aqueous equipment blank results are all in micrograms per liter. See text for discussion of failed SVOC aqueous results.

Validation of Chemical and Radiochemical Data) (SNL/NM July 1994). The following subsections summarize the QA/QC data and findings.

3.2.5.1 Field QA/QC

As part of the QA/QC measures taken during the confirmatory soil sampling project in May 1996, an equipment blank and a field duplicate sample were collected. The equipment blank was collected after cleaning the sampling equipment to check the thoroughness of the decontamination procedures. It was analyzed for RCRA metals, beryllium, HEs, and SVOCs. The results indicated that no analytes were detected in the water sample above the respective method detection limits (Table 3-3). However, the aqueous SVOC results for the equipment blank were deemed invalid as a result of problems with the laboratory batch QC samples, discussed in Section 3.2.5.2. The samples were reanalyzed, but were outside of the holding time at that point.

The duplicate sample was collected from location CY12A-GR-004, at a depth of 0 to 6 inches. It was analyzed for RCRA metals, beryllium, HEs, and SVOCs. The relative percent difference values between the field sample and its duplicate were within ±15 percent for all metals. No HEs or SVOCs were detected in either the field sample or its duplicate.

3.2.5.2 Laboratory QA/QC

The laboratory QA/QC indicated the laboratory was generally in control during analysis of the Site 12A field samples. Minor laboratory method blank contamination was noted for lead in soil; the corresponding field samples were qualified with a "B" for lead concentrations (but none was above the UTL). In addition, laboratory method blank contamination was noted for bis (2-ethylhexyl) phthalate (an SVOC) in soil, but no samples contained any SVOCs. However, during the data verification process, it was noted that the results for SVOCs in water were invalid because of repeated, multiple failures of the surrogates, laboratory method blank, and other laboratory batch QC samples (specifically, the laboratory control sample and its duplicate). The samples had been reanalyzed, but had exceeded the holding time at that point. Thus, the SVOC results for the equipment blank were rejected. The results for the other analytical methods (metals and HEs) for the equipment blank were unqualified. However, none of the field samples indicated SVOC contamination, so it appears likely that no cross-contamination occurred, irrespective of the SVOC results for the equipment blank. The matrix spike/matrix spike duplicate data were all valid, indicating that no matrix effects had adversely influenced the data.

3.3 Gaps in Information

The major gap in information for Site 12A is the lack of historical documentation regarding original practices and whether any material was placed in the arroyo. Efforts to determine the potential presence and extent of contamination have been thorough. Follow-up interviews were conducted with Burn Site personnel to find out any possible information related to past activities

in the area that might have resulted in a release at the site. No new information was gained that indicated any potential release of waste or contamination. In addition, historic aerial photographs have been analyzed, and on-ground surveys for UXO/HE, radiological contamination, and cultural and biological resources have been conducted. The subsequent soil sampling conducted at the site included a wide range of analyses to identify any possible contaminant sources.

3.4 Risk Evaluation

Because none of the metals or radionuclide concentrations observed in the soil samples collected from ER Site 12A in May 1996 exceeded their respective background concentration UTLs, no risk assessment was performed for the site.

Ecological risk has not been addressed in this NFA proposal because the ecological risk analysis for ER Site 12A has not been estimated at this time. Site-wide ecological risk analyses are being conducted and the relevant analysis for this site will be presented when available.

4.0 RATIONALE FOR NO FURTHER ACTION DECISION

Based on the information presented in Section 3.0, ER Site 12A is proposed for a decision of NFA. Criterion 3 is applicable to Site 12A, specifically that "no release to the environment has occurred, nor is likely to occur in the future" (NMED April 1996).

5.0 REFERENCES

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